REMARKS

In response to the Office Action mailed December 24, 2009 (hereinafter "the Office Action"), the Assignee respectfully requests reconsideration. Claims 1-27 were previously pending in the application. By this amendment, claim 16 is cancelled without prejudice or disclaimer. Claims 1-15, 17-19, 21 and 23-27 are amended. Support for the amended claims can be found throughout the specification, including the drawings and claims as originally filed, and at least at page 4, line 6 – page 5, line 6; page 8, lines 4-14; page 10, line 4 – page 13, line 21 and FIGS. 2 and 4. No new matter has been added. As a result, claims 1-15 and 17-27 are pending for examination with claims 1, 6, 11, 17, 21, and 24 being independent.

Claim Rejections Under 35 U.S.C. § 103: Claims 1-16

Beginning at page 4, the Office Action rejects claims 1-16, of which claims 1, 6, 11, and 16 under 35 U.S.C. § 103(a) as purportedly being unpatentable over Neti (U.S. Patent No. 5,953,701) in view of Yang (U.S. Patent Publication No. 2001/0010039) in further view of Kanevsky (U.S. Patent No. 6,529,902). Without acceding to the correctness of the rejection and to advance prosecution, the Assignee has amended claims 1-15 and cancelled claim 16. The Assignee respectfully traverses the rejections of claims 1-15 to the extent they are maintained against the claims as amended.

Claim 1

Claim 1 is directed to a computer readable medium product encoded with instructions for generating a speech recognition model from female, male and gender-independent phoneme models. Claim 1 recites, "determining a difference between each female phoneme model and each corresponding male phoneme model; creating a gender-independent phoneme model when the difference between the compared female phoneme model and the corresponding male phoneme model is less than a predetermined value; and adding, based on a criterion, one of the gender-independent phoneme model, or both the female phoneme model and the corresponding male phoneme model to the speech recognition model." The Assignee submits that at least these

elements of claim 1 are not taught or suggested in Neti, Yang, or Kanevsky, and therefore claim 1

patentably distinguishes over Neti, Yang, and Kanevsky for the reasons set forth below.

Page 2 of the Office Action acknowledges that Assignee's arguments presented in the prior

Amendment beginning at page 15 and filed November 23, 2009 were deemed persuasive. In that

Amendment, Assignee argued that Neti failed to teach or suggest elements of claim 1 relating to

"determining a difference" and "creating a gender-independent speech recognition model." Since

the Office Action acknowledged these arguments as persuasive, it is of record that Neti fails to teach

or suggest at least these elements of claim 1. In setting forth the rejection of claims 1-16 beginning

at page 5 of the Office Action, Neti is cited again as teaching "determining a difference…" and

"creating a gender-independent speech recognition model…" Assignee's arguments presented in

the Amendment of November 23, 2009, which the Office Action acknowledged as persuasive, are

repeated with same effect. Therefore, Neti fails to teach or suggest at least these elements of claim

1. Neti further fails to teach or suggest "adding, based on a criterion, one of the gender-independent

phoneme model, or both the female phoneme model and the corresponding male phoneme model to

the speech recognition model." As persuasively argued in the prior Amendment, Yang fails to cure

the deficiencies of Neti.

Kanevsky is relied upon in the Office Action, at page 6, for disclosing "the difference in

model information between the phoneme models of the pair of corresponding phoneme models is

insignificant." However, this does not cure the deficiencies of Neti and Yang. In particular,

Kanevsky also fails to teach or suggest, "determining a difference between each female phoneme

model and each corresponding male phoneme model;   creating a gender-independent phoneme

model when the difference between the compared female phoneme model and the corresponding

male phoneme model is less than a predetermined value; and adding, based on a criterion, one of the

gender-independent phoneme model, or both the female phoneme model and the corresponding

male phoneme model to the speech recognition model" as recited in claim 1. Therefore, Neti, Yang,

and Kanevsky fail to teach or suggest every element of claim 1.

The Office Action at page 7 states, in view of Kanevsky, that "it would have been obvious

… to allow for an improved language modeling for automatic speech <u>decoding and differentiation</u>

between data groups, wherein a sufficiently large threshold indicates either <u>separate or</u>

combinational probabilities (emphasis added)." As stated above, claim 1 is directed to generating a speech recognition model. Claim 1 does not recite "wherein a sufficiently large threshold indicates either separate or combinational probabilities." The conclusion drawn from Kanevsky in the Office Action has no clear bearing on claim 1.

Further, the Office Action does not set forth how one of ordinary skill in the art would have modified the primary reference Neti. In particular, what elements of Neti would have been modified or replaced by the teachings of Yang and Kanevsky. As explained in the prior Amendment filed November 23, 2009 Neti teaches the use of binary decision trees in constructing "context-dependent sub-phonetic models" (Neti, Col. 3, line 44 – Col. 4, line 9). Thus, even if one of ordinary skill would have modified Neti based on the teaching of Yang and Kanevsky, one would have obtained some sort of a context-dependent binary decision speech recognition model, with no clear description of how the model would have been generated. Again, claim 1 is directed to steps for generating a speech recognition model.

In view of the foregoing, claim 1 patentably distinguishes over Neti, Yang, and Kanevsky. Accordingly, withdrawal of the rejection of claim 1 under 35 U.S.C. § 103(a) is respectfully requested. Claims 2-5 depend from claim 1, and are therefore allowable for at least the same reasons.

Claim 6

Claim 6 encompasses a system for generating speech recognition models and recites, "determine a difference between each first phoneme model and each corresponding second phoneme model; create an independent phoneme model when the difference between the compared each first phoneme model and each corresponding second phoneme model is less than a predetermined value; and add, based upon a criterion, one of the independent phoneme model, or both the first phoneme model and the corresponding second phoneme model to the speech recognition model." For reasons that should be clear from the discussion of claim 1 above in connection with Neti, Yang, and Kanevsky, these cited references fail to teach or suggest every element of claim 6. Therefore, claim 6 patentably distinguishes over Neti, Yang, and Kanevsky.

Withdrawal of the rejection of claim 6 under 35 U.S.C. § 103(a) is respectfully requested. Claims 7-10 depend from claim 6 and are therefore allowable for at least the same reasons.

Claim 11

Claim 11 encompasses a computer program product and recites, "determine a difference between each first phoneme model and each second phoneme model; create an independent phoneme model when the difference between the each first phoneme model and the each corresponding second phoneme model is less than a predetermined value; and add, based on a criterion, one of the independent phoneme model, or both the first phoneme model and the corresponding second phoneme model to the speech recognition model." For reasons that should be clear from the discussion of claim 1 above in connection with Neti, Yang, and Kanevsky, these cited references fail to teach or suggest every element of claim 11. Therefore, claim 11 patentably distinguishes over Neti, Yang, and Kanevsky. Withdrawal of the rejection of claim 11 under 35 U.S.C. § 103(a) is respectfully requested. Claims 12-15 depend from claim 11 and are therefore allowable for at least the same reasons.

Claim Rejections Under 35 U.S.C. § 103: Claims 17-27

Beginning at page 12, the Office Action rejects claims 17-27 under 35 U.S.C. §103(a) as purportedly being unpatentable over Neti in view of Wark (U.S. Patent Publication No. 2003/0231775) and in further view of Yang. Without acceding to the correctness of the rejection and to advance prosecution, the Assignee has amended claims 17-19, 21 and 23-27. The Assignee respectfully traverses the rejections of claims 17-27 to the extent they are maintained against the claims as amended.

Claim 17

Claim 17 is directed to a computer readable medium product encoded with instructions and recites, "computing best estimates that the current feature vector belongs to each one of the plurality of data classes; computing accumulated confidence values for each of the plurality of data classes that the current feature vector belongs to each one of the plurality of data classes, the confidence

value for each data class based on the current best estimate and on previous confidence values for the each data class; weighing the class-dependent phoneme models based on the accumulated confidence values; and recognizing the current feature vector based on the weighted class-dependent phoneme models." The Assignee submits that at least these elements of claim 17 are not taught or suggested in Neti or Wark, and therefore claim 1 patentably distinguishes over Neti and Wark for the reasons set forth below.

The Office Action cites Neti at Col. 3, lines 50-67 and Col. 5, lines 9-21 as teaching computing "a current vector probability that the current feature vector belongs to one of the plurality of data classes." Amended claim 17 now recites, "computing best estimates that the current feature vector belongs to each one of the plurality of data classes; computing accumulated confidence values for each of the plurality of data classes that the current feature vector belongs to each one of the plurality of data classes, the confidence value for each data class of the plurality of data classes based on the current best estimate for the data class and on previous confidence values for the data class, the previous confidence values associated with previous feature vectors of the audio stream; weighing the class-dependent phoneme models based on the accumulated confidence values; and recognizing the current feature vector based on the weighted class-dependent phoneme models." Neti fails to teach or suggest these elements of claim 17. In particular, none of the cited sections or description of Neti teaches or suggests computing best estimates and accumulated confidences for each of a plurality of data classes as recited in claim 17. Since Neti fails to teach or suggest every element of claim 17, claim 17 patentably distinguishes over claim 17.

Wark is relied on, at page 13 of the Office Action, for disclosing "a weighing module configured to weigh class models based on the accumulated confidence." Amended claim 17 now recites, "computing accumulated confidence values for each of the plurality of data classes that the current feature vector belongs to each one of the plurality of data classes, the confidence value for each data class based on the current best estimate and on previous confidence values for the each data class; weighing the class-dependent phoneme models based on the accumulated confidence values." The sections of Wark [0146] and [0094] cited in the Office Action describe segmenting an audio clip and calculating a confidence score (as a difference of model scores normalized by a distance value) for the purposes of classifying an audio segment, but fails to teach or suggest

computing accumulated confidence values or weighing phoneme models as recited in claim 17. The Office Action does not identify where these elements of the claim can be found in Wark. Accordingly, Wark fails to teach or suggest every element of claim 17 for which Wark was relied upon. Therefore, claim 17 patentably distinguishes over Neti and Wark.

Yang is relied on for teaching "phoneme training data and phoneme models." However, Yang provides no teaching or suggestion of at least "computing accumulated confidence values for each of the plurality of data classes that the current feature vector belongs to each one of the plurality of data classes, the confidence value for each data class based on the current best estimate and on previous confidence values for the each data class; weighing the class-dependent phoneme models based on the accumulated confidence values" as recited in claim 17. Therefore, claim 17 patentably distinguishes over Neti, Wark and Yang, since the cited references, considered alone or in combination, fail to teach or suggest every element of claim 17.

Further, the Office Action does not set forth <u>how</u> one of ordinary skill in the art would have modified the primary reference Neti. In particular, what elements of Neti would have been modified or replaced by the teachings of Wark and Yang. As explained in the prior Amendment filed November 23, 2009 Neti teaches the use of binary decision trees in constructing "context-dependent sub-phonetic models" (Neti, Col. 3, line 44 – Col. 4, line 9). Thus, even if one of ordinary skill would have modified Neti based on the teaching of Wark and Yang, one would have obtained some sort of a context-dependent binary decision speech recognition model, which lacks phenome model weighing as recited in claim 17.

In view of the foregoing, claim 17 patentably distinguishes over Neti, Wark and Yang. Accordingly, withdrawal of the rejection of claim 17 under 35 U.S.C. § 103(a) is respectfully requested. Claims 18-20 depend from claim 17, and are therefore allowable for at least the same reasons.

<u>Claim 21</u>

Claim 21 encompasses a system for recognizing speech data and recites, "a first computing module configured to compute current best estimates that the current feature vector belongs to each one of the plurality of data classes; a second computing module configured to compute accumulated

confidence values for each of the plurality of data classes that the current feature vector belongs to each one of the plurality of data classes, the confidence value for each data class of the plurality of data classes based on the current best estimate for the data class and on previous confidence values for the data class, the previous confidence values associated with previous feature vectors of the audio stream; a weighing module configured to weigh the class-dependent phoneme models based on the accumulated confidence values; and a recognizing module configured to recognize the current feature vector based on the weighted class-dependent phoneme models." For reasons that should be clear from the discussion of claim 17 above in connection with Neti, Wark, and Yang, these cited references also fail to teach or suggest every element of claim 21. Therefore, claim 21 patentably distinguishes over Neti, Wark, and Yang. Withdrawal of the rejection of claim 21 under 35 U.S.C. § 103(a) is respectfully requested. Claims 22-23 depend from claim 21 and are therefore allowable for at least the same reasons.

Claim 24

Claim 24 encompasses a computer program product and recites, "compute best estimates that the current feature vector belongs to each one of the plurality of data classes; compute accumulated confidence values for each of the plurality of data classes that the current feature vector belongs to each one of the plurality of data classes, the confidence value for each data class of the plurality of data classes based on the current best estimate for the data class and on previous confidence values for the data class, the previous confidence values associated with previous feature vectors of the audio stream; weigh the class-dependent phoneme models based on the accumulated confidence values; and recognize the current feature vector based on the weighted class-dependent phoneme models." For reasons that should be clear from the discussion of claim 17 above in connection with Neti, Wark, and Yang, these cited references also fail to teach or suggest every element of claim 24. Therefore, claim 24 patentably distinguishes over Neti, Wark, and Yang. Withdrawal of the rejection of claim 24 under 35 U.S.C. § 103(a) is respectfully requested. Claims 25-27 depend from claim 24 and are therefore allowable for at least the same reasons.

General Comments on Dependent Claims

Because each of the dependent claims depends from a base claim that is believed to be in condition for allowance, Assignee believes that it is unnecessary at this time to argue the further distinguishing features of all of the dependent claims. However, Assignee does not necessarily concur with the interpretation of the dependent claims as set forth in the Office Action, nor does Assignee concur that the basis for the rejection of any of the dependent claims is proper. Therefore, Assignee reserves the right to specifically address in the future the further patentability of the dependent claims not specifically addressed herein.

CONCLUSION

In view of the above amendment, Assignee believes the pending application is in condition for allowance.

Assignee believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 23/2825 under Docket No. N0484.70762US00 from which the undersigned is authorized to draw.

Dated: March 24, 2010   Respectfully submitted,

                             By /Marc S. Johannes/
                             Marc S. Johannes
                             Registration No.: 64,978
                             WOLF, GREENFIELD & SACKS, P.C.
                             600 Atlantic Avenue
                             Boston, Massachusetts 02210-2206
                             617.646.8000